REMARKS

In view of the above amendments and the following remarks, reconsideration and further examination are requested.

As required by the Examiner, formal drawings are filed herewith.

By this amendment, claims 13-21 have been canceled in favor of new claims 22-29. Support for the new limitations present in claims 22-29 can be found at least at: column 37; Fig. 4; Fig. 22; Fig. 99; column 14, lines 32-63; Fig. 6; column 18, lines 40-42; column 21, lines 6-26; and Fig. 21.

Non-statutory Double Patenting Based on In re Schneller

Claims 13-21 were provisionally rejected under the judicially created doctrine of double patenting over claims in co-pending applications 09/686,466, 09/688,028, and 09/686,465.

According to MPEP § 804(II)(B)(2), page 800-27, with respect to non-statutory double patenting rejections based on In re Schneller, 397 F.2d 350, 158 USPQ 210 (CCPA 1968), "the approval of the TC Director must be obtained before such a non-statutory double patenting rejection can be made." (Emphasis added). Further, it is worth noting the Board of Appeals & Interferences decision in Ex parte Davis, which, while not a precedential opinion, reflects a PTO Board of Appeals and Interferences opinion that "the principal opinion therein [i.e., in Schneller] is of doubtful controlling precedent." Ex parte Davis, 56 USPQ2d 1434, 1436 (Bd. Pat. App. & Inter. 2000). This decision by the Board serves to reinforce the necessity of obtaining the approval of the TC Director before such a double patenting rejection is imposed.

It is submitted that the requisite approval of the TC Director has not been obtained. In a telephone conversation with the Examiner, the Examiner directed the undersigned attorney "to assume that the Director's approval has not been obtained" when responding to the outstanding Office Action, and that the Examiner intends to remove the rejection and maintain the obviousness-type double patenting rejections.

Accordingly, it is requested that the provisional non-statutory double patenting rejection based on In re Schneller be withdrawn.

Non-statutory Obviousness-Type Double Patenting

Claims 13-21 were also rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 16 of U.S. Patent No. 5,555,275. This rejection is traversed and is inapplicable to new claims 22-29.

Each of the independent claims of the present application, i.e., claims 22, 24, 26, and 28, includes a recitations that:

(1) a distance in the vector space diagram between any closest two signal points of any adjacent two signal point groups is 2δ x n, where n is a shift value which is more than 1,

(2) a distance in the vector space diagram between any closest two signal points in each signal point group is less than 2δ and

(3) 2δ represents a distance in the vector space diagram between any adjacent two signal points when the m signal points are allocated in the vector space diagram at equal intervals along the I and Q axis of the vector space diagram.

The Examiner's attention is directed to column 37 of the present application for the details of the supporting disclosure of the presently discussed claim recitations. The above recitations can be seen graphically in Fig. 99 of the present application.

In order to explain recitation (3) above, take signal points 83a and 83b shown in Fig. 99 as an example. It can be seen that the distance between point 83a of the signal point group in the upper right quadrant and the point 83b of the adjacent signal point group in the upper left quadrant is 2δ. This is the situation with the shift value n=1, i.e., when the signal points are allocated at equal intervals in the I axis and Q axis directions.

But in the present invention, the location in the vector space diagram of some of the signal points differs from such an equal-interval allocation such that a distance in the vector space diagram between any closest two signal points of any adjacent two signal point groups is 2δ x n, where n is a shift value which is more than 1. This is the feature of recitation (1) above. This distance 2δ x n between any closest two signal points of any adjacent two signal point groups is shown in Fig. 99. Fig. 99 shows the shift in one quadrant as nδ from each axis I and Q, thus the distance between any closest two signal points in adjacent groups is 2δ x n. However, as shown in Fig. 99 and discussed

in column 37, points 83a, 84a and 86a are shifted to points 83, 84 and 86, respectively, but point 85 is not shifted. The result is the feature of recitation (2) above, specifically the distance in the vector space diagram between any closest two signal points in each signal point group is less than 2δ.

Claim 16 of the '275 patent applied by the Examiner recites features similar to recitations (1) and (3) above, i.e., the location of the signal points differing from the equal-interval allocation, but the claim does not recite the feature of recitation (2) above, i.e., that the distance in the vector space diagram between any closest two signal points in each signal point group is less than 2δ. Thus, relating the shifting recited in the '275 patent to Fig. 99 of the present application, all four points of each signal group are shifted away from each axis I and Q with the distance between the points within each group remaining unchanged. Therefore, there is no recitation in the claims of the '275 patent that the distance between any closest two signal points in a signal point group is less than 2δ. Rather, the claims of the '275 patent recite that this distance is equal to 2δ.

In view of the above, it is submitted that claims 22-29 would not have been obvious to a person having ordinary skill in the art at the time the present invention was made in view of the invention claimed in U.S. Patent No. 5,555,275.

Art Rejection Based on Oshima, U.S. Patent No. 5,555,275

Claims 13-21 were also rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima 5,555,275.

A Declaration under 37 CFR 1.132 executed by the inventor of the relevant subject matter common to the present application and the applied reference is filed herewith. In view of the filing of the Declaration under 37 CFR 1.132, it is submitted that the rejection under 35 U.S.C. 103(a) based on U.S. Patent No. 5,555,275 has been overcome.

Conclusion

In view of the above amendments and remarks, it is submitted that claims 22-29 are allowable over the prior art of record and that the present application is accordingly in condition for allowance.

The Examiner is invited to contact the undersigned attorney by telephone to resolve any remaining issues.

Respectfully submitted,

Mitsuaki OSHIMA et al.

By: _____
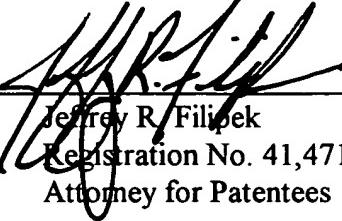
Jeffrey R. Filipek
Registration No. 41,471
Attorney for Patentees

JRF/fs
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
October 24, 2002